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| **Lesson Plan Feedback** |
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| Partner’s name: MaryBeth Sivo(ex ed ) |
| 1. What are the strengths of the lesson (include aspects such as content, structure, UDL, accommodations, assessment, etc.)? |
| I thoroughly enjoyed the youtube video! I especially with the emphasis on conceptualizing the concepts of pi (showing that it is the ratio of the circumference to the diameter), circumference (surrounding), and area showing the circle being covered in another color). The lesson uses music and food as motivators for students. Teacher roles (content and special ed) are clearly defined. Accommodations for students with cognitive disabilities are given throughout the lesson. Technology (you tube, Smartboard, web resources) is infused throughout the lesson. Goals and expectations are clearly defined, measurable, and objective. The lesson includes several types of assessment, both formal and informal, and is designed to appeal to different learner types. |
| 2. What are potential areas for improvement? |
| The lesson is set up to easily incorporate a discussion on the concept of pi versus the approximations used for pi. The students could average their results for the calculating pi portion of the lesson to see that the more data they include, the closer the value of pi becomes to the 3.14 or 22/7 approximation. This would also be a good time to discuss why we say these numbers are an approximation and not an exact value (possibly even leading to a discussion on irrational numbers), and that pi is a ratio rather than an exact numerical value (common misconception).  The lesson neglects the conceptual understanding of area, specifically when it comes to a circle. There are some excellent resources that help with the development of the formula for area of a circle. (Try the [Circle Area Tool](http://www.learner.org/courses/learningmath/measurement/session7/part_b/index.html)). Also, using foods may cause confusion between the concepts of area and volume, so this should be clearly addressed. For example, students may think of the area of the food item as related to the amount of food they are consuming, when in fact the area only represents the top of the item. (Think of a pie with a smaller circumference than a cookie, for example. Since the pie is taller, it may actually have a larger volume than the cookie…)  Since this is both a conceptual and computational lesson, the teacher could have a list of leading questions for open discussion and/or a written reflection. I will send some examples from a lesson I just created on this same subject at the end of this feedback form.  Finally, I would place more emphasis on the development and recording of symbolic rules or formulas. Perhaps a student summary handout would assist with this? |
| 3. General Comments |

This is a wonderful introductory activity focused on developing a conceptual understanding and computational fluency for the concepts associated with circles. This lesson provides a wonderful foundation for connecting geometry and algebra. The lesson is designed to meet students varied learning levels and types. The lesson outline is organized and flows appropriately. I would suggest the use of more open-ended questions to elicit discussion and higher-order thinking skills, as the lesson is set up to transition into higher levels very easily. I would also suggest including modifications for students on higher levels. Overall, I was very impressed with the use of multiple tools/resources and the conceptual focus of the instruction.

One possible extension is included below. In this example, the teacher would give students the inner and outer radius for each set of concentric circles, and students would be asked to calculate the shaded area. This will require students to determine which radius would be needed, etc. (Feel free to copy and paste, if you’d like.) ☺

Some examples of higher-order, open-ended questions, not necessarily in order!

For the circle area tool:

* + What shape is being formed when the circle is “cut”?
    - How is this similar to/different from our “cutting” process for polygons?
    - What happens as the circle is cut into a higher number of shapes?
    - Can we use the parallelogram to develop a formula for the circle?
  + To find the area of a parallelogram, we must multiply the base by its height.
    - What part of the circle represents the “height” of the parallelogram?
    - What part of the circle represents the “base” of the parallelogram?
  + How can we approximate the area of a circle if we know the radius?
  + Write this “rule” in symbolic form.

Other reflections/extensions:

* + Why do we say that the formulas give us the approximate measures of circumference/area as opposed to the exact measures? A: we use an approximation of pi in the formulas, pi is an irrational number
  + Why didn’t we get exactly 3.14 for our Circumference/Diameter ratio column? A: Human error, measuring inconsistency, decimal approximation, pi is irrational
  + What is the meaning of pi?
  + What are the decimal and fractional approximations used for pi?
  + What are the formulas for finding the circumference and area of a circle?